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FENSTER & Co

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY **EXAMINATION REPORT**

(PCT Rule 71.1)

Date of mailing (day/month/year)

24.03.2005

Applicant's or agent's file reference

International application No.

INTELLECTUAL PROPERTY 2002 LTD.

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ISRAEL

285/03306

PCT/IL 02/01037

International filing date (day/month/year)

Priority date (day/month/year)

25.12.2002

25.12.2002

IMPORTANT NOTIFICATION

Applicant

PROTEOPTICS LTD. et al.

- 1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
- 2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
- 3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:

European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465

Authorized Officer

Witzig, A

Tel. +49 89 2399-5937





PATENT COOPERATION TO ATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 285,03306			ent's file reference	FOR FURTHER A	CTION		n of Transmittal of International amination Report (Form PCT/PEA416)
International application No. PCT/IL 02/01037				International filing date 25.12.2002	(day/mon	h/year)	Priority date (day/month/year) 25.12.2002
International Patent Classification (IPC) or both national classification and IPC G01N21/55							
1	licant OTEC	PTIC	CS LTD. et al.				
1.	 This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36. 						
2.	2. This REPORT consists of a total of 7 sheets, including this cover sheet.						
	This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).						
	These annexes consist of a total of 6 sheets.						
3.	This report contains indications relating to the following items:						
	1	Ø	Basis of the opinion				
	11	Ē	Priority				
	Ш		Non-establishment of	opinion with regard to r	novelty, it	ventive step a	and industrial applicability
	IV	\boxtimes	Lack of unity of invent				
	٧	×	Reasoned statement u	under Rule 66.2(a)(ii) w ions supporting such st	ith regar	d to novelty, in	ventive step or industrial applicability;
	VI		Certain documents cit	ed			
	VII		Certain defects in the	international application	า		
	VIII Certain observations on the international application						
Date	Date of submission of the demand			Date of	completion of th	nis report	
22.0	22.07.2004			24.03	2005		
	Name and mailing address of the international				Authori	zed Officer	
preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465				:56 epmu d	Stueb	ner, B one No. +49 89 :	2399-2179

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/IL 02/01037

I.	Basis	of the	report
	2013	O1 1110	ICDUIL

1. With regard to the **elements** of the international application (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)):

	Description, Pages					
	1-2	5	as originally filed			
	Cla	ims, Numbers				
	1-4	4	filed with telefax on 22.07.2004			
	Dra	wings, Sheets				
	1/12	2-12/12	as originally filed			
2.	With regard to the language , all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.					
	The	se elements were av	ailable or furnished to this Authority in the following language: , which is:			
☐ the language of a translation furnished for the purposes of the international search (under Rule 2						
the language of publication of the international application (under Rule 48.3(b)).						
	the language of a translation furnished for the purposes of international preliminary examinat Rule 55.2 and/or 55.3).					
3.	With inte	Vith regard to any nucleotide and/or amino acid sequence disclosed in the international application, the atternational preliminary examination was carried out on the basis of the sequence listing:				
		contained in the international application in written form.				
		filed together with the	e international application in computer readable form.			
		furnished subsequently to this Authority in written form.				
		furnished subsequently to this Authority in computer readable form.				
	The statement that the subsequently furnished written sequence listing does not go beyond the disclosin the international application as filed has been furnished.					
		The statement that the listing has been furnitude.	he information recorded in computer readable form is identical to the written sequence ished.			
4.	The	amendments have re	esulted in the cancellation of:			
		the description,	pages:			
		the claims,	Nos.:			
		the drawings,	sheets:			

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/IL 02/01037

5.		This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).					
(Any replacement sheet containing such amendments rr report.)				nents must be referred to under item 1 and annexed to this			
3.	Add	Additional observations, if necessary:					
V	. Lac	k of unity of invention					
1.	In response to the invitation to restrict or pay additional fees, the applicant has:						
		restricted the claims.					
		paid additional fees.					
		paid additional fees under protest.					
	Ø	neither restricted nor paid additional fees.					
2.		This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.					
3.	This is	nis Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3					
		complied with.					
	Ø	not complied with for the following reasons:					
	see	e separate sheet					
1.	Cor exa	onsequently, the following parts of the international application were the subject of international preliminary camination in establishing this report:					
		all parts.					
	★ The parts relating to claims Nos. 1-13, 40-44.						
٧.	Rea cita	easoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; tations and explanations supporting such statement					
۱.	Stat	tement					
	Nov	elty (N)	Yes: No:	Claims Claims	1-13, 40-44		
	Inve	entive step (IS)	Yes: No:	Claims Claims	1-13, 40-44		
	Indu	ustrial applicability (IA)	Yes: No:	Claims Claims	1-13, 40-44		

2. Citations and explanations

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/IL 02/01037

see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The following documents (D) are referred to in this report:

D1: US-B1-6268125

D2: US-A-6008893

D3: US-A-5313264 (cited by the applicant)

D4: WO-A-02063349 D6: US-A-5917607

2. The common concept of Claims 1, 14 and 27 is the following:

An SPR sensor comprising:

a thin conducting layer...; an illumination system...; and a photosensitive surface... (see e.g. wording of Claim 1);

as well as a flow cell...(see e.g. wording of Claim 14).

Such an SPR sensor is however known from e.g. D1 (see e.g. col.2, I.62 to col.3, I.7; col.4, 38-67; Figs.1-3) or from D3 (see citation in the Search Report).

Thus, the common concept is not new and not inventive.

The requisite unity of invention (Rule 13.1 PCT) therefore no longer exists inasmuch as a technical relationship involving one or more of the same or corresponding special technical features in the sense of Rule 13.2 PCT does not exist between the subject-matter of the following groups of dependent claims (see also Search Report):

A: Claims 1-13,

B: Claims 14-16, and

C: Claims 27-39

It should be noted that dependent Claims 40-44 are common to each of the three inventions.

3. The applicant paid three search fees and, consequently, a Search Report for the three inventions was provided.

However, the applicant did not indicate which of the inventions should be examined and/or did not pay the fees for the further inventions to be examined as requested (see "Invitation to restrict or to pay additional fees").

Thus, the first invention was be examined only.

INVENTION A (Claims 1-13 and 40-44):

4. In D1 (see e.g. col.2, l.62 to col.3, l.7; col.4, 38-67; Figs.1-3) an SPR sensor is described comprising nearly all features corresponding to Claim 1.

Claim 1 differs therefrom in the following features:

- A: "At least a portion" of the wall of the flow channel "is formed from an elastic material";
- B: "At least one hollow needle..." is arranged; and
- C: "A portion" of the wall of the flow channel "is formed by a region of the conducting layer".

However, the use of such hollow needles is well-known in this field; see e.g. D2, col.4, l.25 to col.5, l.41.

To further provide an elastic material at the flow channel in order to inject fluid through this material with the needle is a normal working option.

Finally, the arrangement of the flow cell according to feature C is regarded to be merely one of several straightforward possibilities from which the skilled person would select (see e.g. D1, col.3, II. 5 and 6), in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed.

In view of the paragraphs above, the skilled person would regard it a normal design procedure to combine all the features set out in Claim 1. Thus, the subject-matter of Claim does not involve an inventive step and does not satisfy the criterion set forth in Articles 52(1) and 56 EPC.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT - SEPARATE SHEET

International application No. PCT/IL 02/01037

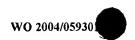
- 5. In Claims 2-13 and 40-44 only slight constructional changes in the apparatus of Claim 1 are defined which come within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, these dependent claims do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step.
- 6. If, in spite of the above-mentioned objections, the applicant wishes to proceed further in the regional phase, the following additional points should be noted, i.e. the corresponding amendments provided:
- 6.1 Also documents D1, D2, D4 and D6 should be mentioned and their contents briefly commented on in the introductory part of the description.
- 6.2 The introductory part of the description should contain statements agreeing with any independent claim submitted.
- 6.3 Any new independent claim should be submitted in the two-part form set out in Rule 6.3 (b) PCT.
- 6.4 In the new set of claims reference signs should be inserted in brackets following those features which are so numbered in the figures (Rule 6.2 (b) PCT).
- 6.5 If new features are taken into the claims, Article 19 (2) of the PCT should not be infringed and it would probably accelerate the examining process if it were indicated from which part of the application any such features are taken.

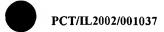


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CLAIMS

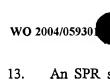
- 1. An SPR sensor comprising:
- a thin conducting layer comprising at least one conductive element formed on a surface of a transparent substrate;
 - an illumination system controllable to illuminate an interface between the conducting layer and the substrate;
 - a photosensitive surface that generates signals responsive to light from the light source that is reflected from a region of the interface;
- a flow cell formed with at least one flow channel having a lumen defined by a wall at least a portion of which is formed from an elastic material and a portion of which is formed by a region of the conducting layer; and
 - at least one hollow needle having an exit orifice communicating with the needle's lumen and wherein fluid flow is enabled between the flow channel and the needle's lumen by puncturing the elastic material with the at least one needle so that the exit orifice communicates with the flow channel lumen.
 - 2. An SPR sensor according to claim 1 wherein the flows cell is produced from of an elastic material.
 - 3. An SPR sensor according to claim 1 wherein the flow cell is formed from a relatively non-elastic material having an insert formed from an elastic material and wherein material of the insert forms at least a portion of the wall of the at least one flow channel.
- 25 4. An SPR sensor according to any of claims 1-3 wherein the end of the needle is closed and the exit orifice is located along the length of the needle.
- An SPR sensor according to any of claims 1-4 wherein when the needle protrudes into the channel it at least partially blocks flow of a fluid from a portion of the channel upstream of the needle to a portion of the needle downstream of the needle.

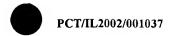




- 6. An SPR sensor according to claim 5 wherein when the needle protrudes into the channel, the needle blocks substantially all fluid flow from the upstream portion to the downstream portion of the channel.
- 5 7. An SPR sensor according to any of claims 1-6 wherein the needle is formed with a depression in the needle wall and wherein when the needle protrudes into the channel the depression forms a shunt channel between the upstream portion of the channel and another channel and at least a portion of a liquid flowing from the upstream portion of the channel towards the downstream portion is shunted through the shunt channel to the other channel.

- 8. An SPR sensor according to any of claims 1-7 wherein upon extraction of the needle a sufficient distance from the elastic material a hole made in the elastic material as a result of the puncturing seals.
- 9. An SPR sensor according to any of claims 1-8 wherein the at least one needle comprises at least two needles for a channel of the at least one channel and to cause a fluid to flow in the channel both needles puncture the elastic material and are positioned to protrude into the channel with their respective orifices communicating with the channel lumen so that fluid may be pumped into the channel via one of the needles and aspirated from the channel via the other of the needles.
 - 10. An SPR sensor according to claim 9 wherein the channel is a blind channel having neither an inlet or outlet orifice.
- 25 11. An SPR sensor according to any of claims 1-10 and comprising a fluid pump coupled to the at least one needle controllable to pump fluid into the needle and thereby, when the needle orifice communicates with the flow channel lumen, into the flow channel.
- 12. An SPR sensor according to any of claims 1-11 and comprising a fluid pump coupled to the at least one needle controllable to aspirate fluid from the needle and thereby, when the needle orifice communicates with the flow channel, from the flow channel.





13. An SPR sensor according to any of claims 1-12 wherein the illumination system comprises:

an array of light sources;

a collimator that directs light from each light source in a collimated beam of light that enters the substrate and is incident on a region of the interface between the substrate and conducting layer region that forms the wall portion of each of the at least one flow channel; and

a light source controller controllable to turn off and turn on a light source in the array independent of the other light sources in the array.

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14. An SPR sensor comprising:

- a thin conducting layer comprising at least one conductive element formed on a surface of a transparent substrate;
- a flow cell formed with at least one flow channel having a lumen defined by a wall a portion of which is formed by a region the conducting layer;
 - a photosensitive surface that generates signals responsive to light reflected from a region of the interface between the region of the conducting layer that forms the wall portion of each of the at least one flow channel and the substrate; and

an illumination system comprising:

an array of light sources;

- a collimator that directs light from each light source in a collimated beam of light that enters the substrate and is incident on a region of the interface between the substrate and conducting layer region that forms the wall portion of each of the at least one flow channel; and
- a light source controller controllable to turn off and turn on a light source in the array independent of the other light sources in the array.
 - 15. An SPR sensor according to claim 13 or claim 14 wherein the array is a linear array having an array axis.

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16. An SPR sensor according to claim 15 wherein the axis of the array and a normal to the interface are substantially coplanar.

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- 17. An SPR sensor according to claim 15 wherein the axis of the array and the normal are substantially perpendicular.
- 18. An SPR sensor according to claim 14 wherein the array is a two dimensional array.
- 19. An SPR sensor according to claim 18 wherein the array comprises rows and columns of light sources.
- 20. An SPR sensor according to claim 19 wherein each column is substantially coplanar with a normal to the interface.
 - 21. An SPR sensor according to claim 19 or claim 20 wherein each row is substantially perpendicular to the normal.
- 15 22. An SPR sensor according to any of claims 19-21 wherein light sources in a same column provide light at substantially same wavelengths.
 - 23. An SPR sensor according to any of claims 18-22 wherein all the light sources in the array provide light at substantially same wavelengths.
 - 24. An SPR sensor according to any of claims 19-23 wherein light sources in a same row provide light at different wavelengths.
- 25. An SPR sensor according to any of claims 14-24 and comprising an optical element having two parallel surfaces through which light from each light sources passes before it is incident on the interface and wherein the optical element is rotatable about an axis perpendicular to the normal so as to change an angle at which light from a given light source is incident on the interface.
- 30 26. An SPR sensor according to any of claims 1-25 wherein the at least one conductive element comprises a plurality of conductive elements
 - 27. An SPR sensor comprising:

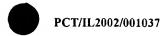
a thin conducting layer comprising a plurality of conducting elements formed on a surface of a transparent substrate;

an illumination system controllable to illuminate an interface between the conducting layer and the substrate;

- 5 a photosensitive surface that generates signals responsive to light from the light source that is reflected from a region of the interface; and
 - a flow cell formed with at least one flow channel having a lumen defined by a wall a portion of which is formed by a region the conducting layer.
- 10 28. An SPR sensor according to claim 26 or claim 27 wherein each conductive element is connected to a power source controllable to electrify the conducting element with respect to a reference electrode.
- 29. An SPR sensor according to claim 28 wherein the plurality of conductive elements comprises a plurality of conducting strips.
 - 30. An SPR sensor according to claim 29 wherein each of the at least one flow channel crosses over each conducting strip.
- 20 31. An SPR sensor according to claim 28 wherein the plurality of conductive elements comprises a plurality of conducting pixels.
 - 32. An SPR sensor according to claim 31 wherein each of the at least one flow channel passes over at least one conducing pixel and each pixel lies under a flow channel.
 - 33. An SPR sensor according to any of claims 28-32 and comprising an exclusive reference electrode for each conducting element relative to which the conducting element is electrified.
- 30 34. An SPR sensor according to any of claims 28-32 wherein all the conducting element are electrified relative to a same reference electrode.



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- 35. An SPR sensor according to claim 33 or claim 34 wherein the reference electrode is located on an external surface of the flow cell.
- 36. An SPR sensor according to claim 33 or claim 34 wherein the reference electrode islocated inside the material from which the flow cell is formed.
 - 37. An SPR sensor according to claim 33 or claim 34 wherein the reference electrode is located on the surface of the substrate.
- 10 38. An SPR sensor according to claim 37 wherein the reference electrode is comb shaped having parallel conducting teeth connected to a common backbone.
 - 39. An SPR sensor according to claim 38 wherein the conductive elements are located between the conducting teeth.
 - 40. An SPR sensor according to any of claims 1-39 wherein the at least one flow channel has a cross section area less than or equal to about a square millimeter.
- 41. An SPR sensor according to any of claims 1-39 wherein the at least one flow channel
 20 has a cross section area less than or equal to about 0.5 square millimeters.
 - 42. An SPR sensor according to any of claims 1-39 wherein the at least one flow channel has a cross section area less than or equal to about 0.2 square millimeters.
- 25 43. An SPR sensor according to any of claims 1-39 wherein the at least one flow channel has a cross section area less than or equal to about 0.1 square millimeters.
 - 44. An SPR sensor according to any of claims 1-43 wherein the at least one flow channel comprises a plurality of channels.